

CLAIMS

WHAT IS CLAIMED IS:

1. A shelving system comprising:
a panel having a plurality of support structures;
one or more posts configured to support the panel;
each support structure including a pair of opposing beam members having
an upper end, a lower end, and an intermediate wall coupling the upper and lower ends;
wherein upper and lower ends of opposing beam members define a
plurality of orifices, and a terminal end of the upper end includes a downward projection
configured to provide strength and rigidity to the panel.
2. The shelving system of Claim 1 wherein the intermediate wall is generally
vertical and approximately perpendicular to the support surface.
3. The shelving system of Claim 1 wherein the intermediate wall is generally
angled relative to the support surface.
4. The shelving system of Claim 1, wherein the projection is configured to
provide a smoother surface without additional finishing operations after the panel is
molded.
5. The shelving system of Claim 4 wherein the beam members from adjacent
support structures form alternating "Z"-shaped members across the width of the support
structure and form a continuous support along the length of the support structure.

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6. The shelving system of Claim 1 wherein the upper ends and lower ends have an increased amount of material compared to the intermediate wall.

7. The shelving system of Claim 6 wherein the upper ends and lower ends have 50% larger wall thickness than the intermediate wall, and extend out from intermediate wall by approximately 100% of the wall thickness.

8. The shelving system of Claim 1 wherein the height of the intermediate wall varies depending on its proximity to the ends of the support structure.

9. The shelving system of Claim 1 wherein the beam members have a curvilinear parabolic shape with a vertex approximately in the middle of the beam members.

10. The shelving system of Claim 9 wherein the plurality of support structures include inner support structures and outer support structures, wherein the outer support structures have a continuous height, and inner support structures have a curved configuration.

sub 11. A shelving system comprising:
a panel including a plurality of support structures;
a plurality of posts configured to support the panel;
each support structure including a set of alternating opposed cavities
defined by a pair of side walls, an upper wall, and a lower wall;
wherein a first cavity is defined by the side walls and the upper wall, and a
second cavity adjacent the first wall is defined by the side walls and the lower wall.

12. The shelving system of Claim 11 wherein the upper wall includes a first
aperture, the lower wall includes a second aperture, and wherein second aperture is
larger than first aperture to maximize the support surface and minimize weight and
material without reducing flexural strength.

sub 13. The support structure of Claim 11 wherein the panel includes three
support structures disposed across the width of the panel.

14. The support structure of Claim 11 wherein the support structures have a
constant height across the length of the panel.

15. The support structure of Claim 11 wherein the height varies so that it has
a reduced height near an outer portion and an increased height near an inner portion of
the support structure.

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16. A shelving system comprising:
one or more panels;
a plurality of posts configured to engage sockets in the panels to support
the one or more panels;

wherein each of the one or more panels includes:

a set of first support structures including a pair of side walls, an
upper wall, and a lower wall defining alternating oppositely disposed cavities;

a set of second support structures including opposing beam
members having an upper end, a lower end, and an intermediate wall coupling
upper and lower ends;

wherein the first and second support structures are combined to
provide particular strength and rigidity characteristics.

17. The shelving system of Claim 16 wherein the intermediate walls and the
side walls are configured to terminate at the sockets.

18. The shelving system of Claim 17 wherein the set of first support structures
are Z-shaped beams and the set of second support structures are box beams.

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19. The shelving system of Claim 16 wherein the height of the intermediate
wall varies depending on its proximity to the ends of the support structures.

20. The shelving system of Claim 16 wherein the first and second support
structures have a curvilinear parabolic shape with a vertex approximately in the middle
of the support structures.

21. The shelving system of Claim 16 wherein the spaced across the width of the panels, and first set of support structures are located towards the outer portion of the panel and the second set of support structures are located toward the interior of the panel.

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